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Item 3 of the provisional agenda*
Implementation of the proposals for action of the Intergovernmental Panel on Forests/Intergovernmental Forum on Forests and the plan of action of the United Nations Forum on Forests

Note verbale dated 23 April 2003 from the Permanent Mission of Nicaragua to the United Nations addressed to the Secretary-General

The Permanent Mission of Nicaragua to the United Nations presents its compliments to the Executive Office of the Secretary-General on the occasion of transmitting the report on the Regional Initiative for the Transfer of Environmentally Sound Technologies for the Sustainable Management of Mangrove Ecosystems in Latin America and the Wider Caribbean: a regional approach initiated by the Government of Nicaragua (see annex).

The Permanent Mission of Nicaragua to the United Nations requests the Executive Office of the Secretary-General, on behalf of the Government of Nicaragua as coordinator of this initiative, to circulate this document at the third session of the United Nations Forum on Forests, to be held from 26 May to 6 June 2003 in Geneva.

* E/CN.18/2003/1.

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Annex

Regional Initiative for the Transfer of Environmentally Sound Technologies for the Sustainable Management of Mangrove Ecosystems in Latin America and the Wider Caribbean: a regional approach initiated by the Government of Nicaragua

In cooperation with the United Nations Forum on Forests within the framework of the environment-related conventions of Antigua, Guatemala (North-East Pacific), Lima (South-East Pacific) and Cartagena (Wider Caribbean) and of the Programme of Cooperation for the Upper South-West Atlantic

I. Introduction

1. In chapter 34 of Agenda 21 the international community recognized that the availability of scientific and technological information and the access by developing countries to, and transfer of, environmentally sound technologies are essential for achieving sustainable development. Ten years later, in 2002, the gap between developed and developing countries and the need for a dynamic and enabling international economic environment supportive of international cooperation, particularly in the area of, inter alia, technology transfer, were further underlined in the Plan of Implementation agreed at the World Summit on Sustainable Development held in Johannesburg, South Africa.

2. Technology transfer is a cross-cutting issue, and it is inseparable from capacity-building: they have become "buzzwords" omnipresent in environmentally related conventions, agreements, programmes, plans and project proposals. Indeed, the efficiency and sustainability of the transfer of technology to developing countries rely on building the appropriate human and institutional capacities. In turn, technology transfer and capacity-building depend on international cooperation and the provision of appropriate financial assistance. Improved technological capabilities are critical for the sustainable utilization of all types of forests. The acquisition of such capabilities in developing countries originates from either technology developed locally or from transfer of technology from elsewhere. However, it is widely recognized that local development of technology through national institutions has been significantly hampered by the lack of financial and human resources; thus, the transfer of technology acquires much more importance. In spite of this, not much follow-up action has been taken over the last decade to follow up what was agreed in 1992 at the United Nations Conference on Environment and Development, held in Rio de Janeiro, Brazil, with regard to the increase of technology transfer to developing countries for sustainable forest management. A renewed call for international cooperation on technology transfer was made at the Johannesburg World Summit.

3. In the light of the foregoing, in September 2002 the Government of Nicaragua expressed to the secretariat of the United Nations Forum on Forests (UNFF) its interest in sponsoring an initiative for the sustainable management of mangrove ecosystems in Latin America and the Wider Caribbean, with the emphasis on environmentally sound technologies. As part of the initiative, the Meeting of Government-designated Experts on the Transfer of Environmentally Sound Technologies for the Conservation and Sustainable Management of Mangrove

Ecosystems in Latin America and the Wider Caribbean was organized by the Government of Nicaragua and the Central American Commission on Maritime Transport (COCATRAM), as executive secretariat of the Convention on Cooperation for the Protection and Sustainable Development of the Marine and Coastal Areas of the North-East Pacific (the Antigua, Guatemala Convention), in cooperation with UNFF, the International Tropical Timber Organization (ITTO), the Ramsar Convention on Wetlands, the Regional Coordinating Unit for the Caribbean Environment Programme of the United Nations Environment Programme (UNEP), as secretariat of the Convention for the Protection and Sustainable Development of the Wider Caribbean (the Cartagena Convention), the Food and Agriculture Organization of the United Nations (FAO), the World Bank and the Central American Bank for Economic Integration.

4. This document provides an overview of the results obtained and the partnerships forged as the initiative unfolded, and it presents the recommendations of the Governments of Latin America and the Wider Caribbean concerning the achievement of sustainable management of mangrove ecosystems within the framework of regional and international cooperation.

II. Values of mangrove ecosystems

5. The values of consumptive and non-consumptive uses associated with mangrove ecosystems are many and diverse, but four main categories can be identified: economic, usefulness (ecological), intrinsic, and symbolic values. Only the first two categories can be quantified in monetary terms, and only the economic values are readily recognizable and relatively easy to quantify. *Economic* values can be recognized in the direct and indirect products that can be obtained from mangroves. *Usefulness (ecological)* values are more difficult to recognize and quantify in monetary terms but include functions that are undoubtedly much more economically important than the "economic" values, such as acting as buffers against natural phenomena (typhoons, storm surge, tidal waves); preventing soil erosion; minimizing water pollution; providing habitat, breeding and nursery grounds for marine fauna; playing an important role in the food chain in marine and coastal ecosystems; and minimizing global warming. *Intrinsic* values refer to the view that organisms, communities and ecosystems have an inherent right to exist independently of any human interest in them. *Symbolic* values are those attached to mangrove areas by indigenous people and include religious, totemic and mythical beliefs. Neither intrinsic nor symbolic values can be quantified or readily evaluated and thus are widely overlooked.

6. Mangrove ecosystems provide key inputs and support to aquaculture in general, in particular to shrimp farming, but these inputs (which include resources such as food, seed and broodstock, and services such as clean water supply) are not widely recognized or appreciated. Other previously unsuspected benefits, although difficult to estimate in monetary terms, should be considered when valuing mangroves. For instance, they are effective biogeochemical barriers to the transfer of pollutants (in particular, heavy metals) generated in landfills near the coast: mangroves fix heavy metals, and their large root systems retain and stabilize sediments more efficiently than bare sediments, thus avoiding the pollutant remobilization by physical disturbance. The use of mangroves in landfill management and the effective retention of heavy metals (such as mercury and zinc)

by mangrove sediments have been successfully achieved. Mangrove forests are directly harvested mainly for fuelwood — especially for charcoal-making — and this is the main mangrove product in many areas. Although timber production from mangrove forests continues to be minor in comparison to that from other types of forests, on a local scale it has been and continues to be important to local communities for house and boat building. Mangrove forests are heavily exploited for, inter alia, firewood, fishing stakes/poles, wood chips, pulp and tannin.

III. Mangrove ecosystems in Latin America and the Wider Caribbean

7. Mangroves are restricted mainly to the tropics (between 30° S and 30° N) and extend beyond to the north in Bermuda and Japan and to the south in Australia and New Zealand. Of the 120 countries with mangroves, 18 have approximately 80 per cent of the estimated 180,000 km^2 of world mangrove forests. Five of these 18 countries are in Latin America and the Wider Caribbean (table 1): Brazil (13,800 km^2 of mangroves), Cuba (5,600 km^2), Mexico (5,300 km^2), Colombia (3,700 km^2) and Venezuela (2,500 km^2). In other countries of Latin America, although mangrove forests are not as extensive, they are sizeable relative to the total length of the coastline. For these countries, the socio-economic and environmental services (including protection against natural environmental disasters and coastal erosion) provided by mangrove forests are of far greater importance (table 2).

Table 1
Estimates of mangrove areas (km^2) from major mangrove-holding countries

South and South-East Asia		Latin America		Africa		Oceania	
Indonesia	42,500	Brazil	13,800	Nigeria	10,500	Australia	11,700
India	6,700	Cuba	5,600	Madagascar	3,200	Papua	
Malaysia	6,400	Mexico	5,300	Guinea-Bissau	2,500	New Guinea	4,100
Bangladesh	6,300	Colombia	3,700	Gabon	2,500		
Myanmar	5,200	Venezuela	2,500	Cameroon	2,400		
Viet Nam	2,500						
Total	69,600	Total	30,900	Total	21,100	Total	15,800

Table 2
Estimates of mangrove forests (km^2) relative to coast length (km) for Central American countries

	Belize	Guatemala	Honduras	El Salvador	Nicaragua	Costa Rica	Panama	Total
Mangroves	115	160	1,458	268	1,550	410	1,708	5,669
Coast	250	403	844	307	923	1,376	2,500	6,603

8. The northern limit of mangrove forests in the tropical eastern Pacific is near Puerto Lobos (30° 15'N) in the Gulf of California, Mexico, while the southern limit is at Punta Malpelo, Tumbes, near the Peruvian-Ecuador border (3° 40'S). Mangrove forests in the South-East Pacific are found from the northern border between Panama and Costa Rica to northern Peru. In the Atlantic Ocean, mangroves range from Bermuda (32°N, the world's most northerly location where mangroves occur), throughout the Wider Caribbean, to Laguna (28° 30' S) in Santa Catarina, northern Brazil.

9. Approximately two thirds of the world's population lives within 100 km of the coast, about 45 per cent of the population is within 150 km and two thirds of all cities with over 2.5 million inhabitants are located along the coast. This situation is dramatically increasing the pressure on coastal habitats and their resources, and the negative effects of ill-planned tourism, urbanization, industry, agriculture, forestry, aquaculture, hydrological changes — and the concomitant effects of increasing commerce and transport-related activities — have an impact on the sustainability of mangrove forests throughout the world. The negative effects of human activities on the coastal environment primarily stem from two sources: *poverty* (frequently associated with excessive population pressure on natural resources) and the negative effects of *economic and social change* (which increases the demand for scarce natural resources, while consumption patterns in industrialized countries add pressure to natural resources in less developed countries). Institutional failure allows these factors to have a much more powerful effect, particularly when Governments are unwilling or unable to correct the market failures that occur when markets do not fully reflect the value of the resources. This is particularly true for mangrove forests. Allocating resources through the establishment of property and use rights is thus fundamental to overcoming market failures.

10. The need that coastal developing countries have for generating urgently economic revenues has led to an increase in activities and practices that negatively impact coastal ecosystems, including mangroves, and also have serious socio-economic implications for local human populations in particular. Increased internal human migration to the coast, coastal development, urbanization, tourism and aquaculture, among other things, not only have increased the demand for more space, jobs, freshwater and food — many times at the expense of natural habitats and by displacing local inhabitants and altering their way of life — but also have increased the demand for municipal and industrial waste-water treatment and added to pollution and the destruction and modification of critical coastal habitats. This situation is compounded by the economic hardship imposed on many poor countries by natural environmental disasters such as hurricanes and floods. It is therefore not surprising that the conservation and sustainable use of coastal natural resources is heavily dependent on how successful we are in ensuring a cross-sectoral and integrated management approach involving all major sectors. Conflicts related to land use and resources negatively affect the sustainability of the various sectoral plans using the coast and its resources.

11. Increasing habitat destruction and ecosystem alterations, whether by physical, chemical or biological means, constitutes the most widespread — frequently irreversible — human impact not only to mangrove forests but also to the whole coastal zone and its resources. There are six main types of human activities which negatively impact mangrove forests: (i) overexploitation by traditional users; (ii) conversion of mangrove land for agriculture and aquaculture; (iii) destruction caused by coastal development; (iv) changes in sediment flows; (v) pollution; and (vi) oil prospecting and exploitation. In addition, mangrove forests located at the periphery of metropolitan areas are being increasingly used for solid waste disposal, a very specific activity which is considered one of the major causes of permanent destruction of mangrove forests. The negative effects of all these activities have been documented in virtually all countries having sizeable mangrove forests.

12. Aquaculture expansion has played a major role in the destruction of mangrove forests in the tropics, and the conversion of mangrove areas into shrimp ponds represents one of the major threats to mangroves in many countries. Poorly planned coastal urban and industrial development has changed and reduced areas previously

covered by wetlands and mangroves all over the tropics and represents the single main threat to mangrove forest worldwide. The construction of harbours, tourism facilities, urban and industrial development, airports and power plants without proper planning and environmental impact assessment has destroyed extensive areas of mangrove forests. Also, deforestation, coastal erosion, increasing saline intrusion, nutrient depletion and sediment accretion caused by damming and diversion of rivers have had a significant impact on mangrove forests and their resources. Rivers are diverted for various purposes, such as to prevent flooding of urban, agricultural and livestock-used lands and for irrigation purposes. Pollution from untreated or inappropriately treated discharges of domestic and industrial wastewater and chemicals used in agriculture not only affect mangroves but also threaten the health of coastal human populations.

13. The major threats to the mangrove ecosystems in Latin America and the Wider Caribbean are: (i) land reclamation for aquaculture, agriculture and urban development; (ii) direct harvest for firewood and building materials for construction of houses, tannin production; and (iii) pollution from industries and from untreated or poorly treated municipal wastewater. Annex 1 contains a compilation, issued by FAO early in 2003, showing the degradation of mangrove ecosystems in Latin America and the Wider Caribbean over the past 30 years. Moreover, since mangroves are the major coastal ecosystems in Latin America and the Caribbean, the impact of, for example, climate change in these areas will certainly be of critical importance from the environmental, economic and social standpoints.

North-East Pacific

14. The mangroves of the North-East Pacific represented, in 1996, some 17 per cent of all Latin American mangroves, with the most extensive mangrove forests occurring along the coasts of Colombia, Panama, Costa Rica, Honduras, Guatemala and Mexico. Mexico's mangrove-estuarine region of Teacapan-Agua Brava-Marismas Nacionales is the most extensive mangrove forest along the Pacific coast of Mexico and Central America. Only a small percentage of the mangrove areas in North-East Pacific countries are currently protected: Colombia (22.2%), Costa Rica (1.9%), El Salvador (0%), Guatemala (16.7%), Honduras (42.2%), Nicaragua (14.8%), Mexico (not available) and Panama (2.1%). Of the 177 wetlands designated as Ramsar sites, 10 are located in the North-East Pacific. Colombia and Panama have lost 60 per cent of their mangrove forests: 5,000 ha of mangroves were cleared in Colombia in 1990 to be used on shrimp culture, while during the last 30 years Panama has lost 5,647 ha of mangroves, which were cleared for agricultural and livestock-related purposes (1,345 ha in Sona district, Veraguas Province, and 2,157 ha in Chiriqui Province). In Costa Rica, deforestation is the major cause of mangrove destruction, as well as industrial pollution from pesticides and from untreated or poorly treated municipal wastewater in the area north of Punta Arenas and near the mouth of Rio Grande de Tarcoles. In Mexico, almost 65 per cent of the original mangrove forests have disappeared in the last 20 years owing mainly to land reclamation for human settlements. Guatemala and El Salvador have lost 20 per cent of their original mangrove forests. The situation is similar in both Honduras and Nicaragua where the main threat to mangroves is land reclamation for urban settlements and for use in aquaculture activities. For instance, between 1973 and 1991, 15,000 ha of mangrove forests and estuaries in the Honduran part of the Gulf of Fonseca were cleared for use in aquaculture.

South-East Pacific

15. During the last 30 years, some 223,451 ha (40% of the original area) of the mangrove forests in the South-East Pacific have been lost owing mainly to exploitation for firewood and for house construction, land reclamation for agriculture, aquaculture and urban settlements. Colombia has lost 61.2 per cent of its original mangrove area, Ecuador 20.4 per cent, Peru 35.1 per cent and Panama 3.4 per cent. In Ecuador, in particular, shrimp aquaculture has played a leading role in the destruction of mangrove forests. The situation is similar in Peru.

Wider Caribbean and Atlantic

16. The extensive mangrove forests of the Caribbean are under acute threat, mainly owing to extraction for lumber and conversion to agriculture, aquaculture, coastal urban settlements, and mining. Among the Caribbean islands, Cuba has the largest extension of mangrove forests; they represent some 26 per cent of the country's forests and 4.8 per cent of the country's total area, and offer an important source of timber for charcoal. An estimated 30 per cent of Cuba's original mangrove forests have been degraded during the last 50 years, mainly owing to socio-economic development, road and dam construction, mining and conversion to agricultural and cattle-grazing lands.

IV. Main regional and international initiatives

17. By March 2003, some 30 States and Territories in the Americas were Contracting Parties to the Ramsar Convention on Wetlands, the most important international agreement related to the conservation and sustainable management of wetlands and mangrove ecosystems. There are 161 Ramsar sites in this region, which cover almost 42 million ha and represent 40.6 per cent of the world's wetlands of international importance. Appendix II, prepared by the Secretariat of the Ramsar Convention on Wetlands, identifies the Ramsar sites with mangrove forests in Latin America and the Wider Caribbean. Although the countries of that region have recognized the environmental and socio-economic importance of mangrove ecosystems, there are to date no regional agreements or programmes specifically designed to ensure their conservation and sustainable management, with the exception of the Work Plan of the International Tropical Timber Organization (ITTO) for 2002-2006.

Regional initiatives

18. Unlike some parts of Asia, where mangrove forests have undergone experimentation with different silvicultural systems for most of the 20th century, American mangroves have received relatively little formal management. Although cutting has been intensive enough to alter significantly the structure and composition of Caribbean mangroves, it has not led to the management of these areas. In addition, the principal commercial products (e.g., tannin, fuelwood and roundwood) have not been harvested in sufficient quantities to justify a concerted investment in careful silviculture. Moreover, hurricanes and other periodic natural disturbances have contributed to this situation by keeping trees below sawtimber size.

19. Probably one of the earliest efforts to specifically address the conservation and sustainable management of mangrove ecosystems in Latin America and the Wider Caribbean as a whole, were the Workshops on Conservation and Sustainable Utilization of Mangrove Forests in Latin America and Africa Regions, held in Niteroi, Brazil, 28-30 May 1993 and in Dakar, Senegal, 20-22 January 1993. The workshops were co-sponsored by ITTO, the International Society for Mangrove Ecosystems (ISME) and the United Nations Educational, Scientific and Cultural Organization (UNESCO).

North-East Pacific

20. Various environmental initiatives and agreements, initiated particularly after the late 1980s, are of importance to the sustainable management of mangrove ecosystems in this region. Some of the most important are listed herein. In 1989, the Central American presidents agreed to create the Central American Commission on Environment and Development (CCAD). The Commission is committed to evaluating and protecting the region's rich biological diversity and, to this end, promotes coordinate action among governmental bodies in such areas as management of natural resources, particularly tropical forests, and the protection of watersheds and transboundary ecosystems. In September 1991, experts from all Central American countries participated in the "Regional Workshop on the Management of Coastal Ecosystems" jointly organized by the CCAD and the Coastal Resources Center of the University of Rhode Island, United States (through the Regional Natural Resources Project, sponsored by the United States Agency for International Development (USAID)). Some of the recommendations of this workshop are relevant to the sustainable management of mangrove forests in the region. In June 1992, the Presidents of Costa Rica, Guatemala, El Salvador, Honduras, Nicaragua and Panama met in Managua, Nicaragua, to sign the Agreement for Conservation of Biodiversity and Protection of Priority Wildlife Areas in Central America. The Agreement has provisions for the conservation and sustainable use of wetlands (and mangrove forests) in the region. In 1993, the Regional Convention for the Management and Conservation of Natural Forest Ecosystems and the Development of Forest Plantation. In 1994, the Alliance for Sustainable Development was established by mutual agreement between the Government of the United States of America and the Governments of the Central American countries, within the framework of the United Nations Conference on Environment and Development. In August 1995, the Tropical Agricultural Research and Training Centre (CATIE) based in Costa Rica, the Rosenthial School of Marine and Atmospheric Conservation of the University of Miami, Florida, United States and the Mesoamerican Program of the International Union for the Conservation of Nature and Natural Resources-World Conservation Union (IUCN) jointly organized a Workshop on Productive Management of Mangroves in Leon, Nicaragua. The workshop was coordinated by CATIE through research projects financed by the Norwegian Agency for Development Cooperation (NORAD), the Danish International Development Agency (DANIDA) and the Swedish International Development Cooperation Agency (SIDA). In December 1995, 108 Governments (including those from the North-East Pacific) adopted the Global Programme of Action for the Protection of the Marine Environment from Land-based Activities (GPA), which deals inter alia with the conservation of mangrove ecosystems.

21. Finally, in February 2001, after several years of intense negotiations, the Governments of Colombia, Costa Rica, El Salvador, Guatemala, Honduras, Mexico,

Nicaragua and Panama signed in Antigua Guatemala the Convention for Cooperation in the Protection and Sustainable Development of the Marine and Coastal Environment of the North-East Pacific. This Convention and its associated Plan of Action, which are the most important instruments for achieving the conservation and sustainable use of natural resources in this region, address mangrove ecosystems. The Central American Commission on Maritime Transport (COCATRAM), located in Managua, is the Executive Secretariat of the North-East Pacific Convention and its Plan of Action. All countries of the North-East Pacific are signatories to the Ramsar Convention on Wetlands and the Conservation on Biological Diversity, the most important international environmental agreements related to the conservation and sustainable use of mangrove forests and their resources. All these countries also participated in the negotiation and adoption of the GPA and participate in the United Nations Forum on Forests (UNFF).

South-East Pacific

22. The most important regional environmental agreement relevant to the conservation of mangrove ecosystems in this region is the Convention for the Protection of the Marine and Coastal Zone of the South-East Pacific, and its Action Plan, both adopted in Lima, Peru, in 1981. The Secretariat of the South-East Pacific Action Plan is the Permanent Commission for the South-East Pacific (CPPS), based in Quito, Ecuador. All Contracting Parties to the Lima Convention (Colombia, Chile, Ecuador, Panama and Peru) are Contracting Parties to the Ramsar Convention on Wetlands and to the Convention on Biological Diversity. They also participated in the negotiations and adoption of the GPA and participate in UNFF.

Wider Caribbean

23. The most important regional environmental agreement (indirectly) dealing with mangrove forests is the Convention for the Protection and Development of the Marine Environment of the Wider Caribbean Region, adopted in Cartagena, Colombia, in 1983. The Secretariat for the Caribbean Action Plan is the Regional Coordinating Unit of the United Nations Environment Programme (UNEP). In 1985, the Caribbean Coastal Marine Productivity (CARICOMP) programme was established; it has received funding from the John D. and Catherine T. MacArthur Foundation, the United States Department of State and UNESCO. The programme is a regional scientific programme and network of marine laboratories, parks and reserves for coastal monitoring and scientific collaboration, focuses on understanding and comparing the structure and functions of mangroves, seagrasses and coral reefs. The CARICOMP network started in 1990 and in 1998 the CARICOMP-Caribbean Coral Reef, Seagrass and Mangrove Sites — a major compendium — was published by UNESCO. Seventeen Caribbean countries (Bahamas, Belize, Colombia, Costa Rica, Cuba, El Salvador, Guatemala, Honduras, Jamaica, Mexico, Nicaragua, Panama, Dominican Republic, Saint Lucia, Suriname, Trinidad and Tobago, and Venezuela) are Contracting Parties to the Ramsar Convention on Wetlands, and the majority are Contracting Parties to the Convention on Biological Diversity. All Caribbean countries participated in the negotiations and adoption of the GPA and participate in UNFF.

Upper South-West Atlantic

24. In this region, mangrove forests are restricted to the subtropical coast of Brazil. A tripartite collaboration for the protection of the marine and coastal environment of Argentina, Brazil and Uruguay is in place, and a regional workshop on the effects on land-based activities in this region was carried out in October 1998, in Manaus, Brazil. The three countries are Contracting Parties to the Ramsar Convention on Wetlands and the Convention on Biological Diversity, and participated in the negotiation and adoption of the GPA and participate in UNFF.

International initiatives

United Nations Forum on Forests and the Action Proposals of the Intergovernmental Panel on Forests/International Forum on Forests

25. In October 2000, the United Nations Economic and Social Council established UNFF with the main objective of promoting the management, conservation and sustainable development of all types of forests and strengthening long-term political commitment. As a means of achieving this end, the Forum was also mandated to take steps to devise approaches towards appropriate financial resources and technology transfer. At its first session (UNFF 1) in June 2001, the Forum stressed the fact that one of its main functions was to facilitate and promote the implementation of the Intergovernmental Panel on Forests (IPF)/Intergovernmental Forum on Forests (IFF) proposals for action and that their implementation would be a key basis for reviewing progress. With this in mind, the Forum adopted the Plan of Action of UNFF, which includes 16 elements for the implementation of the IPF/IFF proposals for action. One of these elements focuses on the "international cooperation in capacity building, and access to and transfer of environmentally sound technologies". The members of the Collaborative Partnership on Forests (CPF), a new international partnership on forests established by the Economic and Social Council in 2001 to support the work of UNFF, were invited to contribute actively to the implementation of the IPF/IFF proposals for action, including through their technical and financial resources. In fact, one of the main functions of CPF is to facilitate and promote the implementation of those proposals for action. It was further agreed that in identifying the criteria for assessing/reviewing the effectiveness of the Forum, various actions should be taken into consideration, including addressing the means of implementation, finance, transfer of environmentally sound technologies and capacity-building in developing countries.

26. Given that the IPF/IFF proposals for action focus on actions to be taken at the national and local level by Governments and other stakeholders, IFF and UNFF agreed that implementation of these proposals should begin with their systematic assessment at the national level, in a process involving all concerned stakeholders so as to build consensus, clarify priorities and responsibilities, and bring new partners. In September 2002, the World Summit on Sustainable Development and its Plan of Implementation specifically called for the creation and strengthening of partnerships and international cooperation to facilitate the provision of increased financial resources, the transfer of environmentally sound technologies, trade, capacity-building, forest law enforcement and governance at all levels, and integrated land and resource management to implement sustainable forest management, including the IPF/IFF proposals for action.

The Food and Agriculture Organization of the United Nations (FAO)

27. FAO was founded in 1945 with the mandate of raising nutritional levels and living standards, improving agricultural production and improving the condition of rural populations. Currently, FAO is one of the largest specialized agencies of the United Nations system, and the lead agency for agriculture, forests, fisheries and rural development. FAO is an international organization which has 183 member States and one member organization, the European Community. FAO seeks to discharge its mandate through four main types of activities: compilation, analysis and dissemination of information; provision of technical and policy advice to Governments; serving as a neutral forum for discussions of technical and policy issues; and provision of direct development assistance through a broad field programme. The work of FAO in relation to mangrove forests includes the development of dissemination materials, guidelines and case studies on better practices in the conservation and sustainable use of mangrove forests; the establishment of information systems and databases such as those which include a description of the mangrove forests in each country and the recently established database containing historical and recent assessments of mangrove forest areas throughout the world; and provision of advice and support for capacity-building and the transfer of environmentally sound technologies relating to mangrove forests. FAO has implemented a total of 66 field projects relating to mangrove forests in 35 countries in the past 35 years.

The Ramsar Convention on Wetlands

28. The Convention on Wetlands, signed in Ramsar, Islamic Republic of Iran, in 1971, is an intergovernmental treaty which provides the framework for national action and international cooperation for the conservation and wise use of wetlands (and thus of those having mangroves) and their resources. The first obligation under the Convention is to designate at least one wetland for inclusion in the List of Wetlands of International Importance (the "Ramsar List") and to promote its conservation, including, where appropriate, its wise use. The Contracting Parties have adopted specific criteria and guidelines for identifying sites that qualify for inclusion in the List of Wetlands of International Importance. The Convention establishes that "*wetlands should be selected for the List on account of their international significance in terms of ecology, botany, zoology, limnology or hydrology*". There are presently 131 Contracting Parties to the Convention, with 1,150 wetland sites, totalling 96.3 million hectares, designated for inclusion in the Ramsar List. Wetlands included in the List acquire a new status at the national level and are recognized by the international community as being of significant value not only for the country, or the countries, in which they are located, but for humanity as a whole. The Convention's mission is the conservation and wise use of wetlands by national action and international cooperation as a means to achieving sustainable development throughout the world.

29. Under the Convention there is a general obligation for the Contracting Parties to include wetland conservation considerations in their national land-use planning. They have undertaken to formulate and implement this planning so as to promote, as far as possible, "*the wise use of wetlands in their territory*" (article 3.1 of the Convention). The Conference of the Contracting Parties has approved guidelines and additional guidance on how to achieve "wise use", which has been interpreted as being synonymous with "sustainable use". A Convention on Biological

Diversity/Ramsar Joint Work Plan for 2002-2006 was adopted by the CBD and Ramsar Parties in early 2002. Joint actions on marine and coastal biodiversity focus on marine and coastal protected areas, development of guidance on integrated marine and coastal area management, and methodologies for the rapid assessment of marine and coastal biological diversity. This Latin American mangrove initiative directly supports the three pillars of the Ramsar Convention on Wetlands: the sustainable use of wetlands, the designation of new Ramsar sites and international cooperation. The Ramsar Convention on Wetlands has supported 35 projects on mangrove forests in various parts of the world.

30. During the Eighth Meeting of the Conference of the Contracting Parties to the Ramsar Convention on Wetlands (Valencia, Spain, November 2002), a resolution (VIII.32) was adopted dealing specifically with the conservation, integrated management and sustainable use of mangrove ecosystems and their resources. Most activities outlined below for preparing a regional strategy on mangrove ecosystems are in full concordance with this resolution.

International Tropical Timber Organization

31. In 2000, the International Tropical Timber Council requested the Executive Director of ITTO to develop a work plan to assist member countries in the conservation, rehabilitation and sustainable utilization of mangroves. To this end, two expert meetings were held in 2002 (the International Mangrove Workshop, Colombia, February; and the Expert Panel on the ITTO Mangrove Work Plan, Japan, April) which culminated in the draft "Mangrove Forest Ecosystem Work Plan" for 2002-2006 submitted to the thirty-second session of ITTO (Indonesia, May 2002). The final work plan, as adopted in May 2002, is comprised of six activity areas dealing with mangrove conservation and sustainable management, awareness, socio-economic aspects, ecosystem functions, cooperation and capacity-building, and policies and legislation.

V. Government-designated Expert Meeting on the Transfer of Environmentally Sound Technologies for the Conservation and Sustainable Management of Mangrove Ecosystems in Latin America and the Wider Caribbean (Managua, Nicaragua, 3-5 March 2003)

32. The meeting was organized by the Government of Nicaragua in cooperation with COCATRAM and a number of other regional international intergovernmental agencies. Through a letter from Nicaragua's Minister of Environment and Natural Resources addressed to all Ministries of Environment, 37 States and Territories in the Americas were invited to attend the meeting. Likewise, all members of CPF, other regional and international governmental and non-governmental organizations and regional development banks were invited to the meeting. The meeting was opened by His Excellency Dr. José Rizo Castellón, Vice-President of Nicaragua.

33. Government-designated experts from the following countries participated in the meeting: Colombia, Chile, Costa Rica, Cuba, El Salvador, Honduras, Nicaragua, Dominican Republic, Suriname and Venezuela. Also, representatives of the following organizations attended the meeting: ITTO, FAO, Ramsar Convention on Wetlands, World Bank, UNEP, Central American Bank on Economic Integration

(CABEI), Japan International Cooperation Agency (JICA), UNFF, the Regional Coordinating Unit of the Caribbean Environment Programme of UNEP (Secretariat of the Convention for the Protection and Sustainable Development of the Wider Caribbean-Cartagena Convention) and COCATRAM (Interim Secretariat of the Convention on Cooperation for the Protection and Sustainable Development of the Marine and Coastal Areas of the North-East Pacific — Antigua Guatemala Convention). The private sector from Brazil and the non-governmental organization MYLENIA from Guatemala were also represented. COCATRAM and UNFF jointly provided the secretariat for the meeting.

34. The following delegates were elected for the Board:

President:
Ms. Liza González/Mr. Carlos Landero (Nicaragua)

Vice-President:
Ms. Mónica Borobia (private sector of Brazil)

Rapporteur:
Mr. Pearl Arthur J. Antonius (Suriname)

35. The meeting also agreed to establish Working Groups tasked with the preparation of regional strategies, as follows:

Group 1. Wider Caribbean and Upper South-West Atlantic:

Chile (President), Colombia (Rapporteur), Cuba, Dominican Republic, Suriname, Venezuela, private sector of Brazil, FAO and the Ramsar Convention on Wetlands

Group 2. North-East Pacific and South-East Pacific:

Costa Rica (President), El Salvador, Honduras (Rapporteur), Nicaragua, World Bank, UNEP, UNFF, COCATRAM, ITTO and MYLENIO from Guatemala.

36. The general objectives for the meeting were: (i) To review the status of conservation of mangrove ecosystems, with emphasis on Latin America and the Wider Caribbean and paying particular attention to main threats and technological and socio-economic factors affecting their sustainability; (ii) To review the status of environmentally sound technologies related to the sustainable management of forests and with specific reference to mangroves, including the identification of barriers and enabling conditions to promote their successful transfer, as well as to exchange experiences and lessons learned; (iii) To evaluate approaches to improve technology transfer; and (iv) To prepare regional strategies for the conservation and sustainable management of mangrove forests in Latin America and the Wider Caribbean, identifying opportunities for cooperation and coordination among countries and regional and international governmental and non-governmental organizations, and the private sector.

37. Appendix III contains the contents list of a document prepared by COCATRAM (with UNFF support) specifically for the meeting, reviewing the available information on transfer of environmentally sound technologies for the sustainable management of mangrove forests.

38. From the presentations by the Government-designated experts during the meeting, the following main common issues were identified:

(i) The need for major coordination among national agencies with competence on mangrove management. To address this need, the meeting considered important the establishment of Mangrove National Committees, in accordance with what was agreed in the framework of the Ramsar Convention on Wetlands;

(ii) The potential offered by sustainable tourism, use of remote sensing and geographical information systems as important tools for contributing to the sustainable management of mangroves;

(iii) The need to complete studies on the economic value of goods and services provided by mangrove ecosystems, and the dissemination of this information at all levels of society; and

(iv) The importance of knowing the evolution of projects conducted in the past (e.g., what were the results, if there has been follow-up) and of access to lessons learned in their implementation.

39. The meeting agreed on the following priority actions and recommendations to follow up on this Latin American initiative on mangroves, finalize the regional strategies and begin activities identified by the experts for 2003:

(i) ***Invite*** the Government of Nicaragua to present the final report of this meeting to the third session of UNFF (Geneva, 26 May-6 June 2003) and to participate in the discussions about the regional initiatives to be held at that session;

(ii) ***Invite*** the Government of Nicaragua to present the results of this expert meeting to the next meeting of ITTO, the regional meeting on watersheds (Arequipa, Peru, June 2003) and other forums;

(iii) ***Send*** the present report and the draft regional strategies on mangroves for the consideration of the secretariats of the three regional Conventions (Wider Caribbean, North-East Pacific and South-East Pacific) and to the countries of the Upper South-West Atlantic for their consideration and eventual adoption and inclusion into the programmes or work plans of such Conventions and agreements;

(iv) ***Request*** the member States of those regional Conventions to internalize the strategies institutionally and to provide the necessary political support for effective implementation of the various activities identified in the regional strategies;

(v) ***Invite*** organizations, agencies and multilateral mechanisms, the private sector, regional development banks and non-governmental organizations to join the efforts of the Governments of the region in implementing the regional strategies through the establishment of partnerships and concrete agreements which contribute to the conservation and sustainable use of mangroves;

(vi) ***Recommend*** to countries' focal points that they emphasize during the third session of UNFF the importance of the mangrove regional initiatives and thus the importance of seeking support to implement them, in particular from UNFF and the members of CPF;

(vii) ***Establish*** Mangrove National Committees as part of the National Committees on Wetlands established within the framework of the Ramsar Convention on Wetlands;

(viii) ***Recommend*** that the Government-designated experts that participated in this meeting act as interim contact points for this regional initiative on mangroves until Governments decide the most appropriate mechanisms to establish Mangrove National Committees;

(ix) ***Recommend*** that the experts who represented the international agencies and organizations act as contact points between their organizations, Governments, and regional and global conventions towards implementation of the regional strategies;

(x) ***Recommend*** that Governments and the secretariats of regional environmental conventions introduce and support this Latin American initiative on mangroves on the various relevant forums;

(xi) ***Inform*** the Secretariat of the Ramsar Convention on Wetlands about the results of this meeting, highlighting the importance that the meeting gave to using the framework of the Convention as the global legal basis for developing and implementing the present Latin American initiative, as well as the need to follow up on implementation of the several resolutions of the Contracting Parties as a means of implementing the mangrove regional strategies;

(xii) ***Inform*** the Conventions and relevant international initiatives (e.g., the United Nations Framework Convention on Climate Change, the Convention on Biological Diversity, the Stockholm Convention on Persistent Organic Pollutants, the International Convention for the Prevention of Pollution from Ships (MARPOL Convention), the International Coral Reef Initiative (ICRI) and the Global Programme of Action for the Protection of the Marine Environment from Land-based Activities) on this regional mangrove initiative and the results of the present meeting, especially on the development of regional strategies, inviting them to participate in their implementation;

(xiii) ***Develop*** criteria for the selection of demonstration projects on the sustainable management of mangroves during 2003-2005;

(xiv) ***Establish*** a regional group of Government-designated experts on mangroves in order to facilitate coordination, follow-up to the agreements reached at the present meeting and implementation of the strategies;

(xv) ***Recommend*** that the Hemispheric Center of the Ramsar Convention on Wetlands located in Panama be used to support implementation of the regional strategies in topics dealing with education, training and exchange of information;

(xvi) ***Establish*** an informal inter-agency group of representatives of the Ramsar Convention on Wetlands, FAO, ITTO, the World Bank, UNFF and the secretariats of the North-East Pacific, South-East Pacific and Wider Caribbean regional seas, to support the regional Government-designated expert groups in implementing the regional strategies on mangroves;

(xvii) ***Finalize*** the working documents submitted to the meeting and publish them; also, submit them as inputs (information documents) of Latin America

and the Wider Caribbean to the global meeting on transfer of environmentally sound technologies for sustainable forest management (to be held in early 2004) being organized by UNFF;

(xviii) ***Establish***, on the basis of existing information clearing-house systems at regional level, a decentralized system (possibly located in the headquarters of the secretariats of the North-East Pacific, South-East Pacific and Wider Caribbean, and in the Upper South-West Atlantic) on mangrove ecosystems and environmentally sound technologies for the sustainable use, conservation, rehabilitation and sustainable management of these ecosystems;

(xix) ***Suggest*** that in developing national mangrove strategies due account be given to ongoing programmes, such as the one of Colombia and other countries in the region;

(xx) ***Welcome*** the interest expressed by the World Wildlife Fund (WWF), the World Conservation Monitoring Centre of UNEP and UNESCO in supporting this Latin American initiative on mangroves and invite them to participate actively in the implementation of the regional strategies; and

(xxi) ***Request*** Latin American and Wider Caribbean Governments to send their evaluations on environmentally sound technologies for the sustainable management of mangroves at national level to UNFF, as was agreed as part of the work plan of the regional strategies.

40. The Government of Nicaragua, as leader of this Latin American initiative, thanks all the Governments, organizations and other partners that supported this important regional effort, and urges the organizations identified in these recommendations — particularly each of the members of CPF — to provide concrete and firm support (in the form of financial resources and technical advice) to the Governments of the region in the follow-up to these recommendations.

41. Likewise, in view of its experience and its mandate with respect to mangroves, the secretariat of the Ramsar Convention on Wetlands is requested to coordinate the efforts of the various organizations and partners to support the Governments of the region in refining and implementing the regional strategies for the conservation and sustainable management of mangrove forests in Latin America and the Wider Caribbean. The latter will have to be done within the framework of, and in close cooperation with, the secretariats of the environment conventions for the North-East Pacific, the South-East Pacific and the Wider Caribbean.

Appendix I

North and Central America

	Extent						
	Most reliable recent mangrove area estimates		Mangrove area 1980	Mangrove area 1990	Annual change 1980-1990	Mangrove area 2000	Annual change 1990-2000
Country/area	Ha	Reference year	Ha	Ha	%	ha	%
Anguilla	90	1991	90	90	n.s.	90	n.s.
Antigua and Barbuda	1 175	1991	1 570	1 200	-2.4	900	-2.5
Aruba	420	1986	420	420	n.s.	420	n.s.
Bahamas	141 957	1991	170 000	145 000	-1.5	140 000	-0.3
Barbados	14	1991	30	16	-4.7	10	-3.8
Belize	65 767	1995	75 000	68 800	-0.8	62 700	-0.9
Bermuda	16	1992	17	16	-0.6	15	-0.6
British Virgin Islands	587	2001	660	630	-0.5	590	-0.6
Cayman Islands	7 268	1991	7 300	7 300	n.s.	7 200	n.s.
Costa Rica	41 330	1992	41 000	41 000	n.s.	41 000	n.s.
Cuba	529 700	1992	530 500	529 800	n.s.	529 000	n.s.
Dominica	10	1991	40	13	-6.8	9	-3.1
Dominican Republic	21 215	1998	33 800	26 300	-2.2	18 700	-2.9
El Salvador	26 800	1994	47 200	35 600	-2.5	24 000	-3.3
Grenada	255	1992	295	262	-1.1	230	-1.2
Guadeloupe	2 325	1997	3 900	2 500	-3.5	2 300	-0.8
Guatemala	17 727	1998	19 800	17 800	-1.0	15 800	-1.1
Haiti	15 000	1990	17 800	15 000	-1.6	10 000	-3.3
Honduras	54 300	1995	156 400	103 300	-3.4	50 000	-5.2
Jamaica	9 731	1997	23 000	10 800	-5.3	9 300	-1.4
Martinique	1 840	1998	1 900	1 900	n.s.	1 800	n.s.
Mexico	488 000	1994	640 000	543 000	-1.5	440 000	-1.9
Montserrat	5	1991	5	5	n.s.	5	n.s.
Netherlands Antilles	1 138	1980	1 140	1 138	n.s.	1 130	n.s.
Nicaragua	282 000	1992	336 000	280 000	-1.7	214 300	-2.3
Panama	158 100	2000	230 000	166 000	-2.8	158 000	-0.5
Puerto Rico	6 410	2001	6 500	6 400	-0.2	6 400	n.s.
Saint Kitts and Nevis	79	1991	84	80	-0.5	75	-0.6
Saint Lucia	200	2002	200	200	n.s	200	n.s
Saint Vincent and the Grenadines	51	1991	60	52	-1.3	45	-1.3
Trinidad and Tobago	7 150	1991	9 000	7 200	-2.0	6 600	-0.8
Turks and Caicos Islands	23 600	1991	23 600	23 600	n.s.	23 600	n.s.

	Extent						
	Most reliable recent mangrove area estimates		Mangrove area 1980	Mangrove area 1990	Annual change 1980-1990	Mangrove area 2000	Annual change 1990-2000
Country/area	Ha	Reference year	Ha	Ha	%	ha	%
United States of America	**197 648**	**2001**	263 000	260 000	-0.1	203 000	-2.2
United States Virgin Islands	**978**	**1991**	978	978	n.s.	978	n.s.
Total North and Central America	**2 102 886**	**1991**	**2 641 289**	**2 296 400**	**-1.3**	**1 968 397**	**-1.4**

South America

	Extent						
	Most reliable recent mangrove area estimates		Mangrove area 1980	Mangrove area 1990	Annual change 1980-1990	Mangrove area 2000	Annual change 1990-2000
Country area	Ha	Reference year	Ha	ha	%	ha	%
Brazil	**1 012 376**	**1991**	**2 640 000**	**1 150 000**	**-5.6**	**1 010 000**	**-1.2**
Colombia	**379 954**	**1996**	**440 000**	**396 600**	**-1.0**	**354 500**	**-1.1**
Ecuador	**149 688**	**1999**	**193 000**	**166 400**	**-1.4**	**147 800**	**-1.1**
French Guyana	**55 000**	**1980**	**55 000**	**55 000**	**n.s.**	**55 000**	**n.s.**
Guyana	**80 400**	**1994**	**91 000**	**83 400**	**-0.8**	**76 000**	**-0.9**
Peru	**4 791**	**1992**	**7 600**	**5 000**	**-3.4**	**4 700**	**-0.6**
Suriname	**98 121**	**1998**	**115 000**	**105 600**	**-0.8**	**96 300**	**-0.9**
Venezuela	**250 000**	**1986**	**260 000**	**240 000**	**-0.8**	**230 000**	**-0.4**
Total South America	**2 030 330**	**1992**	**3 801 600**	**2 202 000**	**-4.2**	**1 974 300**	**-1.0**

Appendix II

Ramsar sites in Latin America and the Wider Caribbean

NORTH AMERICA			
MEXICO	Ría Lagartos Reserve wetland of special importance for waterfowl conservation	21°30'N 088°00'W	60348
MEXICO	Marismas Nacionales	22°08'N 105°32'W	200000
MEXICO	Pantanos de Centla biosphere reserve	18°18'N 092°27'W	302706
MEXICO	La Encrucijada biosphere reserve	15°11'N 092°53'W	144868
UNITED STATES OF AMERICA	Everglades	25°00'N 080°55'W	566143
UNITED STATES OF AMERICA	Pelican Island National Wildlife Refuge	27°48'N 080°25'W	1908
			1275973
NEOTROPICS			
BRAZIL	Reentrancias Maranhenses	01°41'S 045°04'W	2680911
BRAZIL	Baixada Maranhense Environmental Protection Area	03°00'S 044°57'W	1775036
BAHAMAS	Inagua National Park	21°05'N 073°20'W	32600
COLOMBIA	Río Magdalena estuarine delta system, Ciénaga Grande Sta.Marta	10°45'N 074°29'W	400000
COSTA RICA	Palo Verde	10°20'N 085°20'W	24519
COSTA RICA	Caño Negro	10°52'N 084°45'W	9969
COSTA RICA	Tamarindo	10°19'N 085°50'W	500
COSTA RICA	Terraba-Sierpe	08°52'N 083°36'W	30654
COSTA RICA	Gandoca-Manzanillo	09°37'N 082°40'W	9445
COSTA RICA	Manglar de Potrero Grande	10°51'N 085°47'W	139
CUBA	Ciénaga de Zapata	22°20'N 081°22'W	452000
CUBA	Buenavista	22°27'N 078°49'W	313500
CUBA	Ciénaga de Lanier y Sur de la Isla de la Juventud	21°36'N 082°48'W	126200
CUBA	Gran Humedal del Norte de Ciego de Avila	22°19'N 078°29'W	226875
CUBA	Humedal Delta del Cauto	20°34'N 077°12'W	47836
CUBA	Humedal Río Máximo-Cagüey	21°43'N 077°27'W	22000
ECUADOR	Manglares Churute	02°28'S 079°42'W	35042
ECUADOR	Isla Santay	02°13'S 079°51'W	4705
ECUADOR	Humedales del Sur de Isabela	00°57'S 090°58'W	872
FRANCE	Grand Cul-de-Sac Marin de la Guadeloupe	16°20'N 061°35'W	20000
FRANCE	Basse-Mana	05°40'N 053°45'W	59000
FRANCE	Marais De Kaw	04°38'N 052°07'W	137000
GUATEMALA	Manchón-Guamuchal	14°28'N 092°05'W	13500

GUATEMALA	Punta de Manabique	15°50'N 088°28'W	132900
HONDURAS	Barras de Cuero y Salado	15°45'N 087°02'W	13225
HONDURAS	Parque Nacional Jeanette Kawas	15°51'N 087°40'W	78150
HONDURAS	Punta Izopo wildlife refuge	15°44'N 087°21'W	11200
HONDURAS	Sistema de Humedales de la Zona Sur de Honduras	13°20'N 087°25'W	69711
HONDURAS	Laguna de Bacalar	15°08'N 085°10'W	7394
JAMAICA	Black River Lower Morass	18°04'N 077°48'W	5700
NICARAGUA	Cayos Miskitos and immediate coastal strip	14°23'N 082°46'W	85000
NICARAGUA	Estero Real and Llanos de Apacunca deltas	12°53'N 087°13'W	81700
NICARAGUA	Refugio de Vida Silvestre Río San Juan	10°56'N 083°40'W	43000
NICARAGUA	Sistema de Humedales de la Bahía de Bluefields	11°55'N 083°45'W	86501
NETHERLANDS (Aruba)	Het Spaans Lagoen	12°30'N 070°00'W	70
NETHERLANDS (Netherlands Antilles)	Het Lac	12°06'N 068°14'W	700
PANAMA	Golfo de Montijo	07°45'N 081°07'W	80765
PANAMA	San San — Pond Sak	09°30'N 082°30'W	16414
PANAMA	Punta Patiño	08°18'N 078°14'W	13805
PERU	Manglares de Tumbes	03°25'S 080°17'W	2972
SURINAME	Coppenamemonding	05°56'N 055°43'W	12000
TRINIDAD AND TOBAGO	Nariva Swamp	10°23'N 061°04'W	6234
UNITED KINGDOM (Turks and Caicos Islands)	North, Middle & East Caicos Islands	21°45'N 071°45'W	58617
UNITED KINGDOM (Cayman Islands)	Booby Pond and Rookery	19°40'N 080°04'W	82
UNITED KINGDOM (British Virgin Islands)	Western Salt Ponds of Anegada	18°43'N 064°19'W	1071
UNITED KINGDOM (Bermuda)	Hungry Bay Mangrove Swamp	32°16'N 064°45'W	2
UNITED KINGDOM (Bermuda)	Lover's Lake Nature Reserve	32°21'N 064°42'W	2
UNITED KINGDOM (Bermuda)	Paget Marsh	32°16'N 064°46'W	11
UNITED KINGDOM (Bermuda)	Somerset Long Bay Pond	32°17'N 064°51'W	1
VENEZUELA	Cuare	10°55'N 068°20'W	9968
VENEZUELA	Archipielago Los Roques	11°50'N 066°45'W	213220
VENEZUELA	Laguna de la Restinga	11°02'N 064°09'W	5248
VENEZUELA	Laguna de Tacarigua	10°12'N 065°56'W	9200
VENEZUELA	Ciénaga de Los Olivitos	10°55'N 071°26'W	26000

Appendix III

Transfer of Environmentally Sound Technologies for the Sustainable Management of Mangrove Forests: An Overview

Contents

Abstract

I. Introduction

II. Review of the IPF/IFP proposals for action relevant to the transfer of environmentally sound mangrove forest management technologies

III. Status of mangrove forests and a review of the socio-economic factors affecting their sustainability:

Brief status of mangrove forests worldwide

Brief status of mangrove forests in Latin America and the Wider Caribbean

Socio-economic factors affecting the sustainability of mangrove forests and the cross-sectoral nature of mangrove management

The value of mangrove forests

The importance of direct and indirect mangrove products on the local, national and international market

IV. Review of some past and ongoing initiatives and efforts for the conservation and sustainable management of mangrove ecosystems in Latin America and the Wider Caribbean:

North-East Pacific

Wider Caribbean

South-East Caribbean

Upper South-West Atlantic

V. Overview of environmentally sound technologies relevant to mangrove forests:

Forests resource assessment and science

Remote sensing

Geographical information systems

Monitoring

Surveys

Mapping

Forest resource assessment

Inventories and sampling

Valuation

Management

Mangrove silviculture

Macro propagation of mangroves

Rehabilitation and restoration

Indigenous technologies

Protected areas

Biotechnology

Harvesting and transports

Wood processing and use

Non-wood forest products processing and use

Marketing and trade

Certification

Ecolabelling

VI. Barriers and enabling conditions for the successful transfer of environmentally sound technologies for sustainable management of mangrove forests

VII. Approaches for improving the transfer of environmentally sound technologies for the sustainable management of mangrove forests:

Forest resource assessment and science

Management

Marketing and trade

What makes (or can make) mangrove forest sustainable exploitation an attractive investment?

North-South, South-South and North-South-South cooperation and institutional/human capacity-building in the use/application of current emerging environmentally sound technologies

Role of economic policy instruments (direct and indirect) and appropriate conditions for their implementation

VIII. Initiatives on the transfer of environmentally sound mangrove-related technologies

IX. The International Tropical Timber Organization Forest Ecosystem Work Plan 2002-2006

X. Recommendations

Annexes

1. Distribution of mangrove forests

2. Ramsar sites worldwide containing mangroves

3a. Mangrove timber production in selected countries

3b. Mangrove-based fishery catches in selected countries

3c. Cultured shrimp production (tons) from mangrove areas in selected countries in 1994

3d. Non-timber mangrove forest products in selected countries

4. Geographical information systems (GIS)

5. Valuation approaches of ecosystem services

6. Mangrove rehabilitation projects worldwide

7. Examples of management alternatives for mangrove forests in Pagbilao, the Philippines

8. Available forest-related certification schemes and initiatives

9. International assistance for the transfer of environmentally sound technologies of potential relevance to mangrove forests: a review

10. Projects on mangroves supported by the Ramsar Convention on Wetlands worldwide

11. International Tropical Timber Organization mangrove work plan 2002-2006

Endnotes

Appendix IV

Background and inputs for the development of strategies for the conservation and sustainable development of mangrove ecosystems in Latin America and the Caribbean

Contents

I. Introduction

II. The value of mangrove ecosystems

III. Overview of mangrove ecosystems in Latin America and the Wider Caribbean

Geographical distribution

Present situation and main threats

North-West Pacific

South-West Pacific

Wider Caribbean

Upper South-West Atlantic

IV. Regional and international initiatives on mangrove ecosystems

Regional

North-West Pacific

South-West Pacific

Wider Caribbean

Upper South-West Atlantic

V. Inputs for the development of regional strategies for the conservation and sustainable management of mangrove ecosystems — main components of a strategy

Basis for action

Objectives of the regional strategy

Criteria for evaluating the effectiveness of regional strategies

Supporting elements for the implementation of the strategies

Regional and international cooperation

VI. Draft work plan 2003-2005

VII. Pilot projects

VIII. Follow-up

Appendixes

Appendix V

Regional strategy for the conservation and sustainable management of mangrove ecosystems in the North-East and South-East Pacific

[Extract from the document prepared by the Working Group]

V. Inputs for the development of regional strategies for the conservation and sustainable management of mangrove ecosystems

Main components of the strategy

1. Basis for action

35. This section can be drawn up by reviewing and summarizing the material included in paragraphs 1-34.

2. Objectives of regional strategies

36. The final objective of a regional strategy must be the conservation, restoration and sustainable management of mangrove ecosystems at both the national and the regional level, on the basis of the following steps and approaches:

A. Identification and evaluation of the problem;

B. Establishment of national (including local) and regional priorities;

C. Establishment of management objectives for the priority national (including local) and regional socio-economic, cultural and environmental problems;

D. Identification, evaluation and selection of strategies and measures, including management approaches and environmentally sound technologies.

3. Criteria for evaluating the effectiveness of regional strategies

37. Specific criteria will have to be developed to evaluate the effectiveness of the strategies, and will have to consider their:

A. Sustainability (environmental, economic and social effectiveness);

B. Equity and agenda;

C. Flexibility in adapting to new environmental, economic and political situations;

D. Efficiency of administration;

E. Timetables;

F. Participatory environmental management.

4. Elements for supporting implementation of the strategies

38. The necessary administrative and management structures for support of the regional strategies will have to be developed. They will include:

A. Institutional arrangements that ensure coordination among sectors and sectoral institutions at the national level, including:

(a) Identifying the institution(s) with responsibilities for sustainable management of mangrove ecosystems;

(b) Providing the institution(s) identified for management of mangrove ecosystems with the human and financial resources and management tools required for the performance of its/their functions;

(c) Promoting the establishment of local mangrove committees with representation, as appropriate, of local multi-ethnic communities and indigenous peoples; and

(d) Establishing a national committee on mangrove ecosystems to ensure effective coordination among sectors and delivery of results;

B. Legal, management and compliance mechanisms, including:

(a) Compulsory environmental impact assessments for any development project in or around mangrove ecosystems;

(b) Promulgation of environmental legislation dealing explicitly with mangrove ecosystems;

(c) Development of guidelines for access to and use of land/soil (inter-tidal zone, beaches and adjacent areas) and other natural resources in mangrove ecosystems;

(d) Consideration of the most important mangrove ecosystems in the national protected areas system;

(e) Promotion of a programme of incentives to encourage the conservation and sustainable use of mangrove ecosystems in accordance with each country's capabilities;

(f) Promotion and implementation of sustainable management of mangrove ecosystems by developing management plans and regulating mangroves;

(g) Promotion of sustainable tourism at the regional level in which mangrove ecosystems are included;

(h) Promotion and facilitation of multiple uses of mangrove resources wherever possible and sustainable, including the use of environmentally sound technologies;

C. Financial mechanisms, including:

(a) Promotion and facilitation by Governments of participation by the private sector (direct and indirect users) in the sustainable use of mangrove ecosystems through, for example, the establishment of public/private sector partnerships;

(b) Preparation and implementation of proposals involving various sectors, to be submitted for financing to multilateral agencies, donor Governments and others;

(c) Innovative financing mechanisms;

D. Means of identifying research and monitoring requirements in support of the strategies, including:

(a) Use and development of standardized methodologies and tools for evaluating and monitoring mangrove ecosystems and improving knowledge of trends with respect to their sustainability by means of systematic information;

(b) Conduct of technological assessments at the national level (for example, what is available, what is being used, what may be most appropriate for local conditions, what technologies are in demand);

(c) Promotion of research applied to use, conservation and management;

E. Contingency planning to respond to natural phenomena and anthropogenic action;

F. Human resources development and education, including:

(a) Support for institutional capacity-building, with special attention to government personnel responsible for conservation and sustainable management, in topics such as economic valuation, restoration, etc. of mangrove ecosystems;

(b) Promotion of training programmes relating to the use, management and dissemination of environmentally sound technologies for sustainable management of mangroves, particularly local communities, through efficient use of extension services, inter alia;

G. Participatory environmental management, including:

(a) Strengthening and/or development of specific activities and programmes for cooperation between environmental non-governmental organizations, universities and research institutes and government agencies, for the purpose of educating all sectors of society in the environmental, social and economic value of mangrove ecosystems;

(b) Inclusion of user groups in the design and implementation of management plans strategies under the co-management system;

H. Development of financing mechanisms and national budget allocations to ensure sustainability of the results of this strategy in accordance with the economic and legal situation of each country in the region.

5. Regional and international cooperation

39. In September 2002, the World Summit on Sustainable Development and its Plan of Implementation specifically called for the creation and strengthening of partnerships and international cooperation to facilitate the provision of increased

financing resources, the transfer of environmentally sound technologies, trade, capacity-building, forest law enforcement and governance at all levels, and integrated land and resource management to promote sustainable forest management. Regional and international cooperation can take various forms, including:

A. Mobilization of experience and knowledge, which may include:

(a) The establishment of links with regional and international organizations, both governmental and non-governmental, with experience and responsibilities relating to the conservation and sustainable development of mangrove ecosystems, in particular with the Ramsar Convention on Wetlands, UNFF, ITTO and its work plan on mangrove ecosystems 2002-2006, the World Bank, FAO, activities of other members of CPF, the ISME, WWF, Conservation International and The Nature Conservancy;

(b) Facilitation and promotion of access to new and innovative environmentally sound technologies for the sustainable development of forests that are relevant to the management of mangrove ecosystems;

(c) Promotion of cooperation with the private sector and environmental non-governmental organizations to introduce cost-effective and environmentally sound technologies and practices relating to mangrove ecosystems;

(d) Facilitation of access to sources (public or private, national or multilateral) of advice and assistance;

(e) Facilitation of the identification of opportunities for projects that will contribute to sustainable development for submission to the private sector and regional development banks;

B. Mobilization of financial resources from various sources to support projects and activities, including inter alia:

(a) The Global Environment Facility (GEF);

(b) Members of CPF;

(c) The Ramsar Convention on Wetlands;

(d) International agencies and donors (for example DANIDA, the Finnish International Development Agency (FINNIDA), SIDA, the Spanish Agency for International Cooperation (AECI), JICA, the USAID, NORAD, the Canadian International Development Agency (CIDA), the European Union and the United Nations Fund);

(e) Regional development banks and funds (CABEI, IADB, Environmental Fund for Central America);

(f) The private sector (for example tourism, fisheries);

(g) Environmental non-governmental organizations (for example WWF, Conservation International, IUCN, The Nature Conservancy).

VI. Draft work plan 2003-2005

40. A series of priorities that could be implemented during 2003-2005 has been identified. The following tasks identified in Main Elements III (Elements supporting implementation of the strategies) and IV (Regional and international cooperation) should form part of the work plan 2003-2005. A tentative work plan and a timetable for implementing the remaining activities and tasks should be drawn up.

Objective 1: Identification and evaluation of problems (2003-2004)

Objective 2: Identification of national (including local) and regional priorities (2003-2005)

41. The central role played by scientific and technical knowledge in mangrove ecosystem management needs to be emphasized. This knowledge should be the basis for the design or amendment of national policies and strategies, which should take into account the economic value of the products and services offered by mangroves and promote the internalization of environmental services. To this end, preparation of the following evaluations is seen as having priority for the next two years:

A. National evaluations of the current situation of mangrove ecosystems and the main factors affecting their sustainability, identifying the mangrove forests that should be "centres of attention" (because of their great environmental importance for wildlife and because they present the most serious conflicts that involve environmental and socio-economic aspects) and accordingly regarded as national priorities where action is required. These national evaluations will have to include:

(a) Development of criteria and guidelines for identifying mangrove forests classified as "centres of attention" at the national and regional level (taking into account the Ramsar resolutions on wetlands, endemic species, reduced populations, areas of flooding, invasive species, ecotourism projects, infrastructure, reservoirs, etc.);

(b) Economic valuation of the goods, products, services and functions of mangrove forests (in terms of, for example, 1 — goods and products: small scale and industrial fisheries, shrimp farms, salt, charcoal and tannin production, harvesting of molluscs and crustaceans; 2 — services and functions: serving as buffers against natural phenomena (hurricanes, storms, tidal waves), prevention of soil erosion, reduction of water pollution, provision of habitat and reproduction and breeding areas for marine fauna, playing an important role in the food chain in marine and coastal ecosystems, reducing global warming, flood control, soil salinization, filtration of water, biological corridors, degradation of organic pollution; 3 — attributes; 4 — conduct of studies to value the timber and goods and services provided by selected mangrove areas) (see, for example, section C on pilot projects);

(c) Identification of sites where economic valuation studies can be conducted;

(d) Systemic analysis of the trends in environmental, social and economic behaviour of the pilot areas selected where economic valuation is being applied;

(e) Evaluation and application of policies, legislation and administrative structure to the use, conservation and management of mangrove ecosystems;

(f) Preparation and/or updating of inventories for the zoning and identification of priority highly vulnerable mangrove ecosystems;

(g) Compilation of information on transboundary aspects relating to mangrove ecosystems;

(h) Evaluation of the impact of the various threats to mangroves (for example, climate change, invasive species and activities conducted involving change in use of the soil, such as aquaculture, development of infrastructure, dams, dykes, diversion of water, alterations in water flows for human consumption and irrigation, changes in minimal flow rates, alterations in sediment flows due to hydrological changes, pollution by pesticides, waste waters, oil spills and municipal sources, land reclamation for housing construction, hunting and poaching of mangrove resources, forest fires and timber extraction);

(i) Inventory of best practices for use, conservation and management;

(j) Inventory and analysis of main users and partners and measurement of business development;

(k) Inventory of capacity and human resources;

(l) Recommendations for the development/adaptation of guidelines and standards;

(m) Development of a geographic information system (GIS).

B. Preparation or conduct of consolidated regional or subregional evaluations of mangrove ecosystems and identification of centres of attention to be regarded as regional or subregional priorities;

C. Review and identification of the lessons learned from previous or ongoing projects relating to mangroves throughout the world (based on the compilation given in appendix II to the working paper);

D. National evaluations of environmentally sound technologies for sustainable management of mangroves, including what technologies are available, which are currently being used, which could be the best suited to local conditions and which are in demand. Technologies will have to include those having to do with:

(a) Mangrove ecosystem assessment and science;

(b) Sustainable management of mangroves;

(c) Recovery and restoration of ecosystems;

(d) Transport routes, communications, local trade and sustainable tourism;

(e) Processing and use of mangrove natural resources;

(f) Processing and use of mangrove-derived products;

(g) Marketing and trade;

(h) Domestic and industrial waste treatment;

E. Preparation of regional and subregional evaluations of environmentally sound technologies for sustainable management of mangroves;

F. Establishment and development of the information system (national, regional) on successful and unsuccessful efforts relating to rehabilitation of mangrove swamps, which should be available on the Internet and in other media;

G. Identification of means of facilitating the transfer of these technologies at the local, national and regional levels;

H. Establishment of environmental education, dissemination, information and extension programmes at the national and regional levels, and making every effort to ensure that these projects are included in educational curricula.

Objective 3: Agreeing on sustainable management objectives for priority problems at the national (including local) and regional levels (2003-onward)

Objective 4: Identification, evaluation and selection of strategies and measures, including sustainable management approaches and environmentally sound technologies (2003-onward)

42. The evaluations will provide the basis for the attainment of objectives 3 and 4, and account will have to be taken of a combination of:

(a) Developing, improving or strengthening human and institutional capacities;

(b) Selecting on the basis of experience regional research and monitoring centres;

(c) Developing sustainable management concepts and tools;

(d) Evaluation of the environmentally sustainable technologies employed;

(e) Requirements and incentives for bringing about the implementation of measures at the national and regional levels, such as regulatory measures, assistance and technical cooperation including training of personnel, and environmental education;

(f) Establishment of institutional arrangements and search for the resources needed to carry out the management tasks associated with the strategies, including implementation of the agreements for their application, at the national (including local) and regional levels;

(g) Design and establishment of a short-term and long-term research programme;

(h) Definition and adoption of environmentally sound technology models for sustainable management of mangroves;

(i) Establishment of mechanisms for encouraging participation by the private sector in partnership with Governments and civil society;

(j) Making of every effort for the adoption and implementation of this strategy by the States parties to the treaty;

(k) Influencing the authorities in each country so that the present strategy and work plan are considered in regional development processes.

VII. Pilot projects (2003-2005)

43. It is suggested that one or two pilot projects be designed, with the participation of the various sectors, and that their implementation be initiated in the period 2003-2005 within the framework of the relevant regional convention/environment programmes. Key partners should be invited to participate and contribute, including UNFF, ITTO, FAO, the Ramsar Convention on Wetlands, CABEI, GEF, the World Bank, UNDP, UNESCO, other members of CPF, international aid agencies, WWF, Conservation International, IUCN and The Nature Conservancy.

44. The criteria for selecting these pilot projects should include, inter alia: (a) a locality of manageable size; (b) the relative importance of the locality in environmental and socio-economic terms; (c) the possibilities of success; (d) the possibilities of replication; and (e) the potential for the establishment or strengthening of partnerships among the various sectors and users in both the public and the private sector.

45. The working group agreed that for the implementation of this strategy the following regional areas were selected for demonstration projects: (a) Gulf of Fonseca; (b) Barra de Santiago (El Salvador) — La Barrona (Guatemala); (c) Estero de Punta Arenas Management Project (Costa Rica); and (d) Manchón Guamuchal (Guatemala).

VIII. Follow-up

46. In the case of the North-East Pacific, it is recommended that the secretariat of the Convention and Action Plan for Cooperation in the Protection and Sustainable Development of the Marine and Coastal Area of the North-East Pacific should support the operation of the strategy and work plan in coordination with each of the countries.

47. For the purpose of follow-up to the agreements reached during the expert meeting, it is proposed that in the course of the two months following the meeting National Mangrove Committees should be established, with the participation of all sectors concerned and with a national perspective. These committees will also coordinate the design and implementation of activities and plans and the mobilization of the necessary financial resources. The government agency responsible for mangrove ecosystems in each country will preside over these

committees, and special attention will have to be paid to the concept of co-management and participation by indigenous communities, local communities, the private sector and environmental non-governmental organizations. The first task of these national committees, once they are established, would be to coordinate the national inputs through the establishment of a regional strategy for the conservation and sustainable management of mangrove ecosystems, which would be drawn up taking this document as a starting point.

48. The regional strategies will have to be integrated into the agreement and plan of action for each region, and accordingly their implementation will have to be coordinated by the secretariat for each of these agreements: North-East Pacific (COCATRAM as interim secretariat) and South-East Pacific (CPPS).

49. For purposes of follow-up on the agreements and implementation of this strategy and work plan, a regional committee will be established. Annual national reports will be drawn up and regional meetings will be held to evaluate the development of the strategy and the work plan.

Appendix VI

Regional strategy for the conservation of sustainable management of mangrove ecosystems in the Wider Caribbean and the Upper South-West Atlantic

[Extract from the document prepared by the working group]

II. Objectives

General objective:

Conservation and management for sustainable use of the mangrove ecosystems at the regional and national levels in the Caribbean and South-West Atlantic region.

Specific objectives:

1. Draw up and/or update the diagnosis and management of national mangrove ecosystems in order to identify the threats and opportunities they represent.
2. Identify the priority areas in accordance with a methodology that includes criteria of conservation, use and sustainable management of mangrove ecosystems.
3. Promote the updating, integration and preparation of a set of regulations (legal or administrative instruments) aimed at regulating the management of mangrove ecosystems.
4. Encourage implementation of specific activities utilizing environmentally sound technologies (remote sensing, geographic information system, mapping, inventory, restoration, monitoring, protected areas, conservation and management areas, legislation among others) in a process of participation, discussion and agreement with local communities that interact with mangroves, with the support of local and international agencies, the public and private sector and civil society at large.

III. Evaluation

To evaluate the effectiveness of application of the objectives, it is proposed that consideration be given to a number of criteria, including: mangrove coverage, health and vitality of mangrove ecosystems, contribution of mangrove ecosystems to the production of environmental goods and services, productive and ecological functions of mangrove ecosystems, maintenance and improvement of the many socio-economic benefits of mangrove ecosystems and existence of a legal, political, institutional, technical and social framework to promote sustainable mangrove management.

Likewise, the criteria defined by other regional and international initiatives applied at the national level in forest management, fisheries and other topics relating to sustainable management.

IV. Elements for supporting implementation of the strategies

The necessary administrative and management structures for support of the regional strategies will have to be established. They will include:

A. Institutional arrangements that ensure coordination among sectors and sectoral institutions at the national level, including:

(a) Identifying and notifying the secretariat of the institution/ agency/department which will be responsible for managing mangrove ecosystems, and clear definition of its responsibilities;

(b) Giving the institution identified a role of coordination and authority (for example, over other agencies), together with the personnel and financial resources required to perform its functions, so that there will be in each country a specific institution to coordinate management of mangrove ecosystems in order to promote the strategy, given that in some cases the issue is the responsibility of various bodies, among which a focal point will be identified; accordingly, it is recommended that for the interim, the people who attended this meeting should be the focal point;

(c) Promoting the establishment of municipal or local mangrove committees with representation of indigenous communities;

(d) Establishing a National Committee on Mangrove Ecosystems to ensure effective coordination among sectors and delivery of results. It is proposed that within the framework of the Ramar Convention on Wetlands, the national mangrove committees should be established as subcommittees;

B. Legal, management and compliance mechanisms, including:

(a) Analysis, review, adaptation and/or application of legislation relating to mangrove ecosystems in each of the countries. Promulgation of legislation dealing explicitly with mangrove ecosystems;

(b) Compulsory environmental impact assessments for development projects affecting mangroves or areas adjacent to them;

(c) Regulation of land ownership and allocation in mangrove ecosystems;

(d) Establishment of economic incentives to promote conservation and sustainable management of mangrove ecosystems;

(e) Promotion and implementation of sustainable management of mangrove ecosystems by developing management plans and regulating mangroves;

(f) Promotion and encouragement of well regulated eco-tourism activities in or around mangrove ecosystems where appropriate;

(g) Promotion and facilitation of multiple uses of mangrove resources wherever possible and sustainable, defining the use of environmentally sound technologies in the broadest sense;

C. Financial mechanisms, including:

(a) Promotion and facilitation by Governments of participation by the private sector in the sustainable use of mangrove forests through, for example, the establishment of public/private sector partnerships;

(b) Participatory preparation of project proposals to be submitted for financing to multilateral agencies, donor Governments and others, regardless of form of ownership;

(c) Promotion of community participation in projects that generate funds as self-management mechanisms in order to improve the quality of life of the communities associated with mangroves;

(d) Innovative financing mechanisms;

D. Means of identifying research and monitoring requirements in support of the strategies, including:

(a) Use of appropriate technologies to evaluate and monitor mangrove ecosystems and improve knowledge of the trends with respect to their sustainability;

(b) Conduct of technical assessments at the national level (for example, what there is and what is being used, what may be most appropriate for local conditions, what technologies are in demand);

E. Contingency planning:

(a) For oil spills;

(b) For dumping of chemicals and other dangerous substances;

(c) For climate change;

(d) For natural disasters;

(e) For erosion processes;

F. Human resources development and education, including:

(a) Strengthening of education and training, especially for women and indigenous communities, in community development programmes;

(b) Promotion among users of the dissemination of environmentally sound technologies for the conservation and sustainable use of mangroves, particularly local communities, with the efficient use inter alia of extension services;

(c) Support for capacity-building, with special attention to government personnel responsible for conservation and sustainable management of mangrove ecosystems;

G. Public participation and awareness promotion, including:

(a) Strengthening and/or development of specific activities and programmes for cooperation between environmental non-governmental organizations, universities and research institutions and government agencies, for the purpose of educating all sectors of

society as to the value and importance of the environmental goods and services provided by mangrove ecosystems;

(b) Inclusion of user groups in the design and implementation of management plans and strategies under the co-management system.

V. Regional and international cooperation

In September 2002, the World Summit on Sustainable Development and Its Plan of Implementation specifically called for the creation and strengthening of partnerships and international cooperation to facilitate the provision of increased financing resources, the transfer of environmentally sound technologies, trade, capacity-building, forest law enforcement and governance at all levels, and integrated land and resource management to promote sustainable forest management. Regional and international cooperation can take various forms, including:

A. Mobilization of experience and knowledge, which may include:

(a) The establishment of links with regional and international organizations, both governmental and non-governmental, with experience and responsibilities relating to the conservation and sustainable development of mangrove ecosystems, in particular with the Ramsar Convention on Wetlands, UNFF, ITTO and its work plan on mangrove ecosystems 2002-2006, the World Bank, FAO, activities of other members of CPF, ISME, WWF, Conservation International and The Nature Conservancy;

(b) Facilitating and promoting access to new and innovative environmentally sound technologies for the sustainable development of forests that are relevant to the management of mangrove ecosystems;

(c) Promoting cooperation with the private sector and environmental non-governmental organizations to introduce cost-effective and environmentally sound technologies and practices relating to mangrove ecosystems;

(d) Facilitating access to sources (public or private, national or multilateral) of advice and assistance;

(e) Facilitating the identification of opportunities for projects that will contribute to sustainable development for submission to the private sector and regional development banks;

B. Mobilization of financial resources from various sources to support projects and activities, including inter alia:

(a) The GEF;

(b) Members of CPF;

(c) The Ramsar Convention on Wetlands;

(d) International agencies and donors (for example DANIDA, FINNIDA, SIDA, AECI, JICA, USAID, NORAD, CIDA, the European Union and the United Nations Fund);

(e) Regional development banks and funds (CABEI, IADB, Environmental Fund for Central America);

(f) The private sector (for example tourism, fisheries);

(g) Environmental non-governmental organizations (for example WWF, Conservation International, IUCN The Nature Conservancy).

VI. Work plan 2003-2005

Objective 1: Draw up and/or update the diagnosis and management of national mangrove ecosystems in order to identify the threats and opportunities they represent

Objective 2: Identify the priority areas in accordance with a methodology that includes criteria of conservation use and sustainable management of mangrove ecosystems

A. National evaluations of the current situation of mangrove ecosystems and the main factors affecting their sustainability, identifying the mangrove forests that should be "centres of attention" (because of their great environmental importance for wildlife and because they present the most serious conflicts that involve environmental and socio-economic aspects) and accordingly regarded as national priorities where action is required. These national evaluations will have to include:

(a) Development of criteria and guidelines for identifying mangrove forests classified as "centres of attention" at the national and regional level;

(b) Establishment of national focal points and of a national mangrove subcommittee within the framework of the National Wetlands Committee pursuant to the Ramsar Convention on Wetlands;

(c) Economic valuation of the products, services and functions of mangrove forests (in terms of, for example, food security, ecological services, biodiversity, economic revenues for local communities, serving as buffer zones against floods and thus protecting coastal human populations, large-scale pollutant filters), with particular attention being paid to (i) contribution of mangroves and the impact of their loss and degradation on local communities, the generation of sustainable socio-economic benefits for the local communities from mangroves; (ii) documentation and promotion of the use of traditional knowledge systems in the management of mangroves; and (iii) conduct of studies to value the timber and goods and services provided by selected mangrove areas (see, for example, section C on pilot projects);

(d) Analysis of trends in selected areas;

(e) Policy and legislation (review of instruments relating to mangroves) and comparative analysis of national legislation for purposes of exchange of experience;

(f) Coordination of the exchange of information in the region, for which purpose it is proposed to use the web page of the Caribbean Environment Programme under the Protocol Concerning Specially Protected Areas and Wildlife (SPAW Protocol);

(g) Inventories, zoning and identification of priority highly vulnerable mangrove ecosystems;

(h) Transboundary issues;

(i) Establishment of a regional information network to facilitate exchange of experience;

(j) Impact of various threats to mangroves (for example, climate change and land-based activities such as aquaculture, tourism development, urban development, alterations of sediment flows as a result of hydrological changes, pollution resulting from agriculture, hydrocarbons and chemicals, coastal erosion and municipal sources);

(k) Inventory of best practices;

(l) Inventory of main users and partners;

(m) Inventory of capacity and human resources;

(n) Conduct of activities for the dissemination of general information on the importance of mangrove ecosystems; and

(o) Recommendations for the development/adaptation of guidelines and standards.

B. On the basis of previous evaluations, conduct of consolidated regional or subregional evaluations of mangrove ecosystems and identification of centres of attention to be regarded as regional or subregional priorities.

C. Review and identification of lessons previously learned or under way that are related to mangroves in Latin America and the Wider Caribbean for the purpose of highlighting the positive aspects and identifying gaps so as to provide for continuity and ensure sustainability of mangrove ecosystems.

D. National evaluations of environmentally sound technologies for sustainable management of mangroves, including what technologies are available, which are currently being used, which could be the best suited to local conditions and which are in demand. Technologies will have to include those having to do with:

(a) Inventory and management;

(b) Ecosystem management;

(c) Restoration and rehabilitation of areas;

(d) Alternative use;

(e) Monitoring and evaluation;

(f) Efficiency in marketing and trade in goods and services from the mangrove ecosystem; and

(g) Capacity-building.

E. The focal points will have to prepare regional and subregional evaluations of environmentally sound technologies for the sustainable management of mangroves, including: (a) the establishment of archiving systems for reports (published and unpublished) on successful and unsuccessful efforts relating to the rehabilitation of mangroves, which should be available through the Internet and other media; (b) identification of the sources of these technologies; (c) means of facilitating the transfer of these technologies to developing countries; and (d) identification of barriers to and favourable conditions for conducting the transfer of environmentally sound technologies.

Objective 3: Promote the updating, integration and preparation of a set of regulations (legal or administrative instruments) aimed at regulating the management of mangrove ecosystems

Objective 4: Encourage implementation of specific activities utilizing environmentally sound technologies (remote sensing, geographic information system, mapping, inventory, restoration, monitoring, protected areas, conservation and management areas, legislation among others) in a process of participation, discussion and agreement with local communities that interact with mangroves, with the support of local and international agencies, the public and private sector and civil society at large

(a) Specific measures: including measures to promote sustainable use of the resources of mangrove ecosystems by preventing or reducing degradation and the deterioration of affected areas;

(b) Requirements and incentives for bringing about implementation of measures at the national and regional levels: economic instruments and incentives, regulatory measures and technical assistance and cooperation, including training of personnel, education and public awareness promotion;

(c) Establishment of institutional partnerships between the different sectors (public and private), identifying the resources needed to carry out the management tasks associated with this strategy, including implementation of the agreements for the attainment of the objectives, at the national (including local) and regional levels;

(d) Identification of the needs for periodic compilation of research and technological data in the short and long term for the purpose of feeding the databases and updating the inventories;

(e) Transfer of environmentally sound technologies for sustainable management of mangroves, and evaluation of approaches to improving such transfer;

(f) Establishment of systems for monitoring and control of the environmental quality of these ecosystems in order to review and, if necessary, assist in adapting the regional and national strategies;

(g) Identification of sources of financing and available mechanisms for covering the costs of administering and implementing these strategies;

(h) Establishment of mechanisms for including participation by the sector in partnership with governments and civil society.

VII. Pilot projects (2003-2005)

Pilot projects involving the participation of the various sectors are indicated below. Their implementation should begin in the period 2003-2005 within the framework of the Caribbean Environment Programme-UNEP-Ramsar Convention on Wetlands.

Key partners should be invited to participate and contribute, including UNFF, ITTO, FAO, the Ramsar Convention on Wetlands, CABEI, GEF, the World Bank, UNDP, UNESCO, UNEP (Caribbean Environment Programme and SPAW Protocol), other members of CPF, international aid agencies, WWF, Conservation International, IUCN and the Nature Conservancy.

A. Economic valuation of mangrove ecosystems

Caribbean-South-West Atlantic Region

Duration: 2003-2005

Objective:

To identify and quantify the environmental goods and services (economic, utilitarian (ecological), intrinsic and symbolic values) in mangrove ecosystems and value them using appropriate methodologies for the purpose of ensuring that they are catalogued as economically sustainable.

Countries:

Dominican Republic — Punta Cana area

Colombia — Cienaya de la Caimenera, Golfo de Morrosquillo

Venezuela — Pedernales

Cuba — Zapata Peninsula

Suriname — Distrikt Paramaribo

B. Restoration and rehabilitation

Caribbean-South-West Atlantic Region

Duration: 2003-2005

Objective:

To initiate or continue the restoration of mangrove areas and protect their capacity, productivity and protective functions.

- To expand the area covered by mangroves by planting

- To promote sustainable management and protection of the mangrove ecosystem

  Dominican Republic — mangroves in the east of the country, Playa Bavaro

  Colombia —Antiguo delta del Sinu — Cispata

  Venezuela — Pedernales

  Cuba — Zapata Peninsula

  Suriname — West Suriname

Countries proposed

Cuba, Dominican Republic, Suriname, Venezuela, Colombia.

Selection criteria:

(i) A locality of manageable size;

(ii) Relative importance of the locality in environmental and socio-economic terms;

(iii) Possibilities of success;

(iv) Possibilities of replication;

(v) Potential for establishing or strengthening partnerships among various sectors and users in both the public and the private sector;

(vi) The project should be conducted in an area where no projects have been undertaken in the mangrove ecosystem, or failing that as a continuation of a project that is under way.

VIII. Follow-up

For the purpose of follow-up to the agreements reached at the Expert Meeting, it is proposed that during the portion of 2003 following the meeting national mangrove committees should be established as subcommittees of the National Wetlands Committees established within the framework of the Ramsar Convention on Wetlands, with the participation of all sectors concerned and with a national perspective. These committees will also coordinate the design and implementation of activities and plans and promote the raising of financial resources at the national and international levels for the implementation of projects in mangrove ecosystems.

The government agency responsible for mangrove ecosystems in each country will preside over these committees, and special attention will have to be paid to the concept of co-management and participation by indigenous communities, local communities, the private sector and environmental non-governmental organizations. The first task of these national committees, once they are established, would be to coordinate the national inputs through the establishment of a regional strategy for the conservation and sustainable management of mangrove ecosystems, which would be drawn up taking this document as a starting point.

The mechanisms for integration among the countries and the secretariats of regional agencies will be the national mangrove committees, in which the focal points will participate actively.

The regional strategies will have to be integrated into the agreement and plan of action for each region, and accordingly their implementation will have to be coordinated by the secretariat for each of these agreements: Wider Caribbean (Regional Coordination Unit of the Caribbean Environment Programme, UNEP) and Upper South-West Atlantic (the national committees on mangroves).

Recommendations

In addition, the working group suggests that the conventions relating to marine areas, such as those on climate change, biological diversity and prevention of pollution from ships, should be reviewed with a view to identifying common areas relating to mangrove ecosystems. Likewise, it is proposed that the secretariats of these conventions be contacted with regard to the initiative of drawing up a regional strategy for the management and transfer of environmentally sound technologies in mangrove ecosystems.

It is suggested that plans be drawn up for each country relating to the conservation, use and sustainable management of mangrove ecosystems.

It is suggested that in drawing up the national strategies, account should be taken of the establishment of programmes such as that drawn up by Colombia (National Programme for the Sustainable Use, Management and Conservation of Colombia's Mangrove Ecosystems).